The Ford Service Bulletin

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VOLUME TALKS

It is volume only that allows us to turn out Ford cars at the present low price. It is equipment which permits us to turn out volume. We spend thousands of dollars annually for equipment. Ofttimes very expensive machines are purchased to perform a simple operation. We are doing this with one end in view, viz: Production.

Production will solve your repair shop problem. Volume will reduce your overhead. Equipment will solve your production problem and the reduced prices at which you will be able to sell your service will remedy your volume problem.

We were more than pleased at the enthusiasm shown by our Dealers in all parts of Canada over the equipment clinics which we conducted in connection with our recent Dealers' conventions. In conducting these clinics we had one thought in view, viz: by showing you through actual demonstration, just how accurately you could follow factory production methods in your repair shop.

How, by the use of modern repair shop equipment, you could work on a volume basis and turn out your repair work in less time, in a more perfect mechanical condition and at a reasonable price which would induce Ford owners to have **you** perform their necessary repair work when it is needed.

A community of healthy Ford Cars is your greatest selling argument.

About Your Service Manager

The Service Department of a Ford Dealer's Organization is one, if not the most important department.

A well organized and properly conducted Service Department not only keeps cars sold but makes sales to prospective customers who may have called from time to time or who may have been impressed by the amount of Service his neighbors or competitors are getting from their cars. In fact we have many cases on record where orders for new cars have been placed directly through the Service Department and where purchasers could not be persuaded to go to the Sales Department to purchase.

Too little attention has been paid to the Service Manager's end of the business. If a Service Manager was a good mechanic and possessed a certain amount of executive ability to handle the men under him, he was pronounced O.K. This attitude is entirely wrong. The Service Manager's scope includes everything from the gasoline pump to the repair shop. Each detail must be thoroughly understood and worked out by him. He must be, first of all, a contact man, a parts stock keeper, a garage man, a trouble shooter and a repair man. In fact, he must be everything but a car salesman and indirectly he must fill this capacity also.

As before stated, his scope begins at the gasoline, for it is here that your customers ofttimes gets his first impression of your business. The man (not a boy) that he places here must be a real contact man ready and willing to perform those little courtesies which go such a long way (especially with women) to promote good will and a pleased customer. He must be able to meet and handle customers when they come to you for repairs or storage. He must thoroughly understand the workings of the parts department and keep in constant touch with every transaction there. He must be able to sell your customers on the repairs they need when they come to you to have this work performed. He must also be able to O.K. this work when the job is completed. He must be able to explain to a customer why the job cost him more for parts than he anticipated, if such a condition arises. He must be a service salesman because he will often have to sell your service to owners who get their repair work done elsewhere. He must also be a purchasing agent because most of your purchases are for his department.

Where the business warrants it, the Service Manager must be a clever organizer because the man in each department under him must be carefully selected. In a smaller organization however, he will have to do most of the work himself with the exception of the repair work.

Ask your Service Manager the following questions; he should be able to say "Yes" to each one of them.

1. Do you enjoy your work?
2. Do you know that the entire automobile industry exists through the sale of new cars?
3. Do you know that Service in all that the word implies is the keynote for all sales?
4. Do you realize that without an efficiently operated parts department, you defeat Service and its object?
5. Do you know parts?
6. Does your stockkeeper employ a perpetual inventory system?
7. Can your stockkeeper begin an inventory of his stock at a moment's notice and give you a fairly accurate one without taking an actual recount?
8. Can you, by merely referring to your records, give the sale of a certain part over a given period?
9. Do you keep in touch with conditions that enable you to buy intelligently?
10. Should a price seem exorbitant to a customer, can you justify it by explaining the various operations necessary to make it?
11. Do you answer correspondence intelligently?
12. Have you the good will and confidence of the men working under you?
13. Do you try to work in co-operation with your Sales Department with regard to the prospect system?

You may say that if it were possible to obtain a man with such ability, he would require such a large salary that we could not afford him. Such is not the case, however, because the extra amount which such a man would bring in from one department alone, would pay the extra amount of his salary.

We also realize that such men are hard to obtain. This condition is caused because Ford Dealers have not awakened to the necessity of the proper management of the Service Department that more good service managers are not being produced. It is a condition that Ford Dealers should study and correct.

Battery Service

In order that you may more clearly understand the storage battery and its capacity for absorbing and delivering its charge, we will compare it to a water tank. Of course, we realize that in actual operation the action is different. However, it appears the same and may be used for a comparison.

Let us take a 60 gallon wooden water tank, with an outlet pipe of sufficient size to supply 225 gallons of water per hour. If this outlet is opened say 20 times per day and left open for ¼ minute each time we will have drained from the tank 18¾ gallons per day.

Now if we have a pump supplying this tank, with a capacity of 10 gallons per hour which only operates 1½ hours per day, we will be supplying to this tank only 15 gallons. This means that we are actually taking out of this tank 3¾ gallons per day more than we are putting into it with a result that in 16 days the tank will be empty. Now we will not only have emptied the tank but we will have allowed the wooden staves to become dried out, causing gaps to form between each stave and when an extra supply of water is pumped into the tank in order to fill it there will be a tremendous loss of water, due to leakage until the staves get swelled back to place again to their original position.

Now on the other hand if our supply is greater than the amount taken out the tank will be strained until some of the hoops break and damage is done. Therefore, we must endeavor to set our pump to supply the same amount as we take out in order to keep the tank in a healthy condition, or if we cannot do this, we must have more water supplied to it at regular intervals from some other source.

In the Ford starting and lighting system, we have a similar condition. We have a battery which is similar to the tank in that it is able to supply one ampere of current for 60 hours or 225 amperes of current for approximately 15 minutes. We have a generator similar to the pump and we have a starting motor which used approximately 225 amperes of current per hour in the case of a tight motor.

For argument let us say our car is operated by a doctor who makes 20 calls per day. He will have to use his starting motor 20 times. If he presses his foot on the starting pedal ¼ of a minute each time he starts his engine, the starting motor will have consumed 18¾ amperes per day. If his generator is set to charge 10 amperes per hour and he actually runs his car at sufficient speed to charge 10 amperes for say 1½ hours per day, he will have charged into the battery 15 amperes. At this rate his battery will be completely discharged in 16 days and we have not allowed any loss for lights at night. As soon as the battery gets in a semi-discharged condition the plates begin to get sulphated and the more the battery becomes discharged the more pronounced will be this effect. A sulphated battery is similar to a water tank which has been dried out, in that it takes an excessive amount of amperes hours of charging to bring it back to a healthy condition. On the other hand, if the driver is one who takes long drives and only uses the starting motor a very few times per day, the battery is likely to be over charged at 10 amperes and causes the battery to become injured.

What we are trying to arrive at is this—in order for you to give first-class battery service you must determine just how the driver is going to use his car and set the third brush on the generator accordingly. If you already know what kind of use the car is going to be put to you can usually set the generator to charge accordingly. We, at the factory, set the third brush to charge 10 amperes which is an average charging rate only. If your driver is a doctor or makes a similar number of short runs in a day, you should set the generator to read say 15 amperes. If he is a travelling man you could set it to read eight or according to the actual conditions.

Perhaps the best method to use would be to have your customer bring his new car in, say in two weeks and test the battery. If it is in a semi-discharged condition, you know the generator is not charging high enough and should be set up according to the amount the battery is run down. If, on the other hand, the battery indicates over-charged, set the brush back. If the battery is partially discharged always take it out and give it a bench charge until it reads 1250 before placing it back in his car. If you allow him to drive away with it in a semi-charged condition, he will be sure to have sulphated plates in a very short time and the battery will be ruined.

A little attention of this kind may save your customers a battery.

Flat Rate Labor Charge

The following list gives the maximum labor charge for repair operation on Ford cars:

The following time covers work on cars driven into the service station:

Operation No.		
1	Overhaul motor and transmission	$30.00
2	Overhaul motor only	25.00
	NOTE—These prices on motor overhaul include rebabbitting bearings and reboring cylinders.	
3	Overhaul transmission only or repair or replace magneto	17.50
4	Rebraze crank case arms or support or repair leak in case by taking out the motor	14.00
5	Install or refit 1 piston or 1 connecting rod	5.50
6	Install or refit two or more pistons or connecting rods	8.50
7	Tighten one connecting rod bearing	2.50
8	Tighten two or more connecting rod bearings	5.00
9	Replace transmission bands	4.00
10	Replace transmission cover gasket	2.50
11	Change motor	6.50
12	Replace cam shaft and refit bearings	6.00
13	Replace cam gear—large	3.00
14	Replace cylinder front cover	2.50
15	Grind valves and clean carbon	4.50
16	Remove carbon only. (This operation to be used only when customer will not permit grinding of valves)	2.00
17	Repair cylinder head bolts stripped—1 or 2	3.00
18	Repair cylinder head bolts stripped under dash	6.50
19	Clean out oil feed pipe	4.00
20	Replace cylinder head gasket	1.25
21	Replace radiator or all 3 hose connections	1.00
22	Replace one hose connection only	.50
23	Replace crank shaft starting pin or pulley	2.50
24	Tighten motor to frame	1.50
25	Clean crank case or install gasket under lower cover	1.00
26	Replace carburetor or manifold or repair leak in manifold	1.00
27	Install new butterfly spring	1.00
28	Overhaul carburetor	1.50
30	Replace commutator wire loom	1.00
31	Replace commutator case or brush	.75
32	Replace commutator pull rod joint	.75
33	Replace or rebush fan pulley assembly	1.00
34	Adjust clutch fingers and trans. bands	.75
35	Adjust trans. bands only	.75
36	Stop oil leak in valve doors	.75
37	Install trans. bands springs each	.75
38	Replace cylinder water jacket plugs	.75
39	Install new starting crank handle	1.00
	Operations 5 and 15 combined on one order	7.00
	Operations 6 and 15 combined on one order	11.00
	Operations 12 and 15 combined on one order	10.50
	Operations 15 and 17 combined on one order	6.00
	Operations 9 and 19 combined on one order	7.00
	Operations 10 and 19 combined on one order	6.00
	Operations 30 and 31 combined on one order	1.00
	Parts brought in or shipped in for repairs:	
55B	Overhaul motor and transmission	25.00
56B	Overhaul motor only	20.00
57B	Overhaul transmission only	6.00
58B	Rebore cylinders only	6.00
59B	Rebore cylinders only including fitting of pistons	8.00
65B	Rebore and fit pistons and valves	$10.00
66B	Rebore and fit pistons, valves and push roads and straighten and fit cam shaft	10.50
67B	Fit pistons, crank shaft and run-in (rebored block)	7.00
68B	Rebush three transmission drums	2.50
69B	Rebush transmission drums—each	1.00
70B	Rebush and re-rivet 3 triple gear assemblies	2.50
71B	Braze crank case arms and support	4.00
72B	Repair crank case drain plug housing	3.00
73B	Overhaul carburetor	1.50
74B	Disassemble 5/8" or 3/4" magnets from flywheel and install new set	2.50
75B	Straighten crank shaft	1.50
76B	Straighten cam shaft	1.00
77B	Straighten cam shaft and fit bearings	2.00
	Operation 71B and 72B on one order	5.00

Rear System Division—Model T

The following time covers work on cars driven into the service stations:

96	Overhaul rear axle and rebush springs and perches when necessary	7.50
97	Repair or replace drive shaft tube	5.00
98	Repair or replace one rear radius rod	2.00
99	Replace rear spring tie bolt or new leaf including polishing and graphiting of leaves and lining up of body	3.75
100	Remove front and rear springs polish and graphite leaves only	6.00
101	Replace spring perches	2.00
102	Pad rear spring to line up body or replace rear spring tie bolt only	3.00
103	Rebush spring and perches	3.00
104	Install universal joint	4.00
105	Straighten axle shaft (without removing from car)	1.50
106	Tighten rear radius rod	1.00
107	Install felt and steel washers	1.50
108	Install brake shoes and equalize emergency brakes	1.50
109	Tighten universal ball cap bolts	.75
110	Install or tighten rear spring clips	.75
111	Tighten rear hub lock nut	.50
112	Fit new hub keys	1.00
113	Replace pull rod supports	1.00
114	Replace or rebush hub brake cam—each side	1.75
115	Replace rear axle assembly	2.75
116	Adjust pull rods or replace one	1.00
117	Straighten rear radius rod (in car)	.75
118	Install outer bearings—each	1.50
119	Replace rear axle, shaft, drive shaft pinion or drive gear (no other work necessary)	5.00
	Operations 96 and 99 combined on one order	10.00
	Operations 96 and 102 combined on one order	9.50
	Operations 96 and 110 combined on one order	8.00
120	Overhaul rear axle on truck	8.50
	Parts brought in or shipped in for repairs:	
140B	Overhaul rear axle	5.50
141B	Straighten or repair rear radius rod	1.00
142B	Overhaul differential assembly with shafts	2.00
143B	Remove old and press new gear on axle shaft—each	.75

Front System Division

The following time covers work on cars driven into the Service Station:

Operation No.		
167	Overhaul front axle including rebushing of springs and perches when necessary, straightening and lining up and adjust- of wheels	$ 5.00
168	Rebush spindle bodies and arms—each side	2.00
169	Replace or straighten front axle (no other repairs)	2.50
170	Rebush spindle body—each	1.50
171	Rebush spindle arm—each	1.00
172	Replace broken off radius rod ball cap stud	3.00
173	Replace front spring tie bolt or new leaf, including polishing and graphiting of leaves	3.00
174	Replace front spring or tie bolt only	1.75
175	Install or tighten front spring clips	1.00
176	Tighten radius rod or steering gear ball cap	.75
177	Replace radius rod	1.00
178	Straighten front radius rod and line up front assem	2.00
179	Replace spindle arm or body and line up assem	1.50
180	Replace radius rod ball cap with new style	1.00
181	Tighten all sockets and joints of front end	2.00
182	Replace or straighten spindle or steering gear connecting rod	1.00
	Operation 167 and 172 combined on one order	7.50
	Operation 167 and 173 combined on one order	8.00
	Operation 167 and 208B combined on one order	8.00

Parts brought in or shipped in for repairs:

202B	Straighten front axle	1.50
203B	Straighten radius rod	.75
204B	Install stud in radius rod	1.00
205B	Rebush spindle body and arm	1.50
206B	Rebush spindle arm	.75
207B	Rebush spindle body	1.00
208B	Rethread front axle by drilling out and bushing	3.00

Chassis Division

The following time covers work on cars driven into the service stations:

Front end and frame—Model T.

228	Replace front cross member	8.50
229	Replace front cross member when radiator is off	7.50
230	Straighten front cross member (without removing from car)	4.00
231	Replace rear cross member	10.00
232	Replace side member or frame (open)	25.00
	(closed)	30.00
233	Install engine pans	1.60
234	Tighten engine pan	1.00
235	Tighten crank case front end bearing cap	1.00
236	Install hood clips or springs on hood board —each side	1.00
237	Free up hand brake lever	1.00
238	Remove radiator to replace radiator stud or tighten fender bracket	1.00
239	Replace starting crank ratchet pin	1.25
240	Replace starting crank or sleeve	1.50
241	Install running board bracket	2.50
242	Repair hand brake lever assem. including replacing of pawl	1.50
243	Replace hand brake running board shield	2.00
244	Tighten all bolts and nuts on car	$ 3.00
245	Tighten body bracket bolts	1.25
246	Install tail lamp bracket	1.50

Fender and Running Boards

258	Replace one fender or running board	1.25
259	Tighten all fenders, running boards shields and truss rods	3.00
260	Remove fender or running board and straighten	2.00
261	Replace running board shield	2.25
262	Install fender-to-shield bracket—each	1.50
263	Install metal tool box	1,00
264	Replace rear fender iron	1.50
265	Replace truss rods	1.25

Dash

276	Replace dash	6.00
277	Replace dash when motor is out	2.50
278	Tighten dash bracket to body and dash	1.50
279	Replace coil box and install Yale lock	2.00
280	Replace coil box, install new switch on coil box or repair the box	2.00

Steering Gear

291	Overhaul steering gear including replacing of quadrant or gear case and rebushing of of bracket	5.50
292	Overhaul steering gear when motor is out	3.00
293	Tighten rivets of internal gear case	2.00
294	Tighten at dash and rebush bracket	2.75
295	Replace wheel or spider	1.25
296	Tighten at dash and post	1.25
297	Replace steering gear assem	3.00
298	Rebush bracket only	2.50
299	Tighten steering gear case cover	1.50

Muffler

310	Change long exhaust pipe	1.50
311	Replace muffler	1.00
312	Repair muffler	1.50
313	Repack exhaust pipe pack nut	.50

Gas Tank and Line

323	Repair leak in touring car gas tank	2.50
324	Repair leak in touring car gas tank (when necessary to remove body)	8.00
325	Clean sediment bulb, gasoline feed line and drain carb	1.00

Hood

336	Straighten hood	2.00
337	Install hood leather	1.25

Radiator

348	Overhaul radiator	8.00
349	Install new core in radiator	6.00
350	Repair radiator, solder one or two tubes	4.00
351	Solder neck or top tank or repair without removing from car	1.00
352	Solder castings to lower or top tank with- out removing radiator	1.75
353	Replace broken pet cock	.75

Wheels

365	Change hub, rear or front	1.50
366	Replace wheel or tire—each	1.25
367	Adjust and dope front wheels	.75
368	Remove front wheels and replace bearing parts	1.50
369	Line up front wheels	.75
370	Oil and dope car, including graphiting springs	2.25

Ford Mechanics' Section

(Continued from Page 71, February, 1923, Service Bulletin)

The Transmission

While the action of the Ford transmission may appear very complicated, it is in reality very simple. Perhaps the hardest part to see through is the action of the three triple gears at once which certainly tends to confuse one. Therefore, we will consider that there is only one set of triple gears installed. In fact, one set will accomplish the same gear action as three, however, three sets are necessary in order to maintain the proper balance of the assembly and to lessen any tendency for the central gears and planetary gears to separate due to worn bushings. They also reduce the wear on any one set and consequently cause quiet action of the gears.

If the mechanic wishes to get a more perfect knowledge of this action he can quite easily assemble parts of a transmission on the crank shaft in his spare time and study this action with this working model.

To do this mount, the crank shaft on the block in the usual manner, being sure that it turns freely. To assemble the transmission, leave two of the planetary gears off, also the clutch discs, or some method will have to be devised for holding the clutch in neutral. Now get some one to turn the crank shaft while you hold the slow speed or reverse speed drum while you note the action of the gears and drive plate. You will note that the action of the gears is as follows:

When slow speed is wanted, the clutch pedal is pushed forward from the neutral position. This causes the band to contract on the central drum holding it in a stationary position, while the engine is running. This also holds the 21 toothed gear stationary which is machined on the end of the sleeve. This 21 toothed gear is meshed with the 33 toothed or central gear on the triple gear which is revolving with the flywheel around it. You will note that in this case the speed of the triple gear is governed entirely by the meshing of the 21 toothed gear and the 33 toothed gear. Therefore, when the 33 toothed gear has made one revolution around the 21 toothed gear it will only have turned 21/33 of a turn on its own shaft or axis with 12/33 of a turn lost, by not only itself but by the 27 tooth drive gear riveted to it. **For every 12/33 of a turn that the 27 toothed drive gear looses, the 27 toothed driven gear (which is keyed to the end of the brake drum sleeve and meshed with the drive gear) gains 12/33 of one turn.** Therefore, in one turn of the crank shaft the driven gear is turned ahead 12/33 of a turn, when the slow speed drum is held stationary by pressing the slow speed pedal forward. To turn the driven gear one complete turn forward, or 33/33 of a turn, the crank shaft will have to make as many revolutions as 12/33 is divided into 33/33 or 33 divided by 12 which equals $2\frac{3}{4}$ turns. Thus, $2\frac{3}{4}$ turns of the engine will produce one forward revolution of the 27 toothed driven gear and drive plate to which it is attached.

Action of Gears in Reverse

In studying the action of the Ford planetary transmission in reverse, we proceed as we did with the low speed, only this time we hold down the reverse or centre control pedal. This causes a band to contract on the forward drum or drum next the gears. When this drum is held stationary with the engine in motion the gear action will appear similar to that in low speed, but in reality the action is just the reverse, as may be noticed on the drive plate.

When you hold this drum stationary you also hold the 30 toothed gear stationary which is attached to it. The reverse triple gear which meshes with it has 24 teeth. **As the 24 toothed triple gear makes one turn around the 30 toothed gear it will have travelled 30 teeth, which is a gain of six teeth for itself. Six teeth on 24 is just ¼ of a revolution gain for the 24 toothed gear and since the triple gears are all riveted together, the 27 toothed driven gear will have gained one-quarter of a turn instead of losing 12/33, as was the case on low gear. This will cause the 27 toothed driven gear to be driven backwards just as much as the 27 toothed drive gear gains since they are the same size.**

Therefore, the driven gear will be turned back one-quarter of a revolution of the flywheel. To turn the driven gear one turn backwards the crank shaft must turn four times. Every four revolutions of the engine when reverse drum is held stationary produces one backward revolution of the driven gear, brake drum and drive plate since they are keyed together.

Don't forget that when you hold the reverse speed drum that the low speed drum and gears simply act as idlers and when you hold the low speed drum the reverse drum and gears are idlers and play no part in the action of the low gear. The fact ofttimes

confuses the mechanic who is apt to try and watch too many sets of gears in action at one time instead of the particular group he is operating.

High Speed

In high speed both low and reverse bands are released so that the gear assembly simply revolves on its common axis or the transmission gear shaft. The gears themselves are stationary and play no part in the high gear.

High gear is accomplished by a direct drive through the clutch which is contained on the inside of the brake drum and drive plate assembly. The clutch disc drum is keyed to the transmission gear shaft. This drum drives the small discs which operate between the large discs (when the clutch is in neutral), which are fastened to the brake drum and drive plate assembly. When these discs are pressed together by the 90 pound spring they make a solid unit which drives the brake drum and drive plate at engine speed. So that on high gear the whole transmission assembly revolves as one unit and turns the drive shaft at full engine speed.

Path of Power

Slow Speed—In low speed the power is transmitted from the crank shaft to the flywheel. Through the planetary gear pins to the low speed or central planetary gear to the slow speed drum gear, to the planetary drive gear and the driven gear, which is keyed to the brake drum sleeve, drive plant and sleeve to **universal joint** and drive shaft.

Reverse

In the reverse gear the power is transmitted from the crank shaft to the flywheel. Through the planetary gear pins to the reverse gear or 24 toothed planetary gear pinion, to the reverse speed drum, to the 27 toothed drive pinion, to the 27 toothed driven pinion, to the 27 toothed driven pinion, to the brake drum sleeve, to which the driver gear is keyed to the drive plate and universal joint.

High Gear

In high speed the power is transmitted from the crank shaft to the flywheel and transmission shaft, to the clutch disc drums, to the small clutch discs, to the large discs, to the brake drum, sleeve and universal joint.

(To be continued)

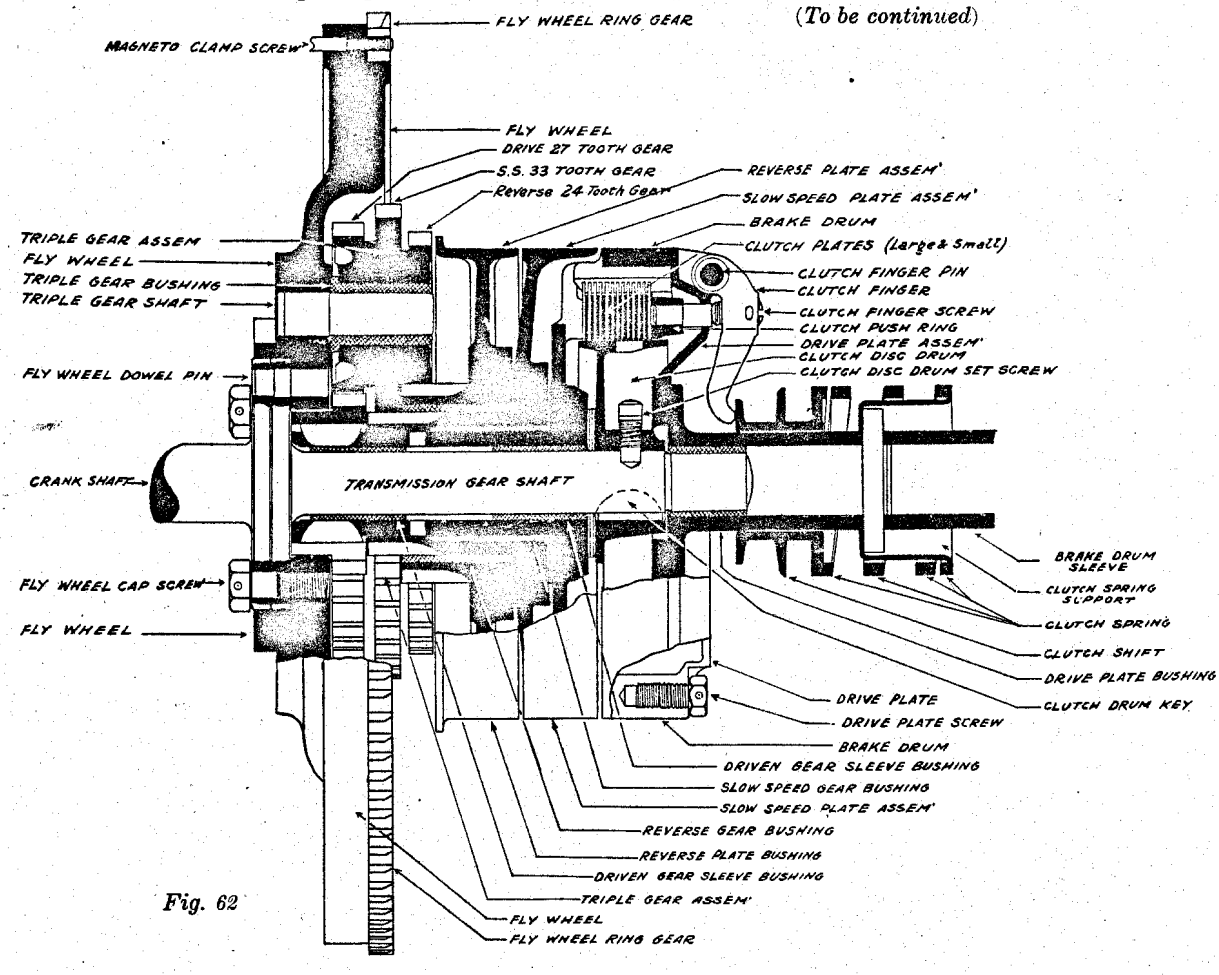

Fig. 62

Put Tractors in Shape For Spring

This is an opportune time for Dealers to suggest to Fordson owners the advisability of putting their tractors in shape for Spring work. When the owner's attention is called to the advantages of having all necessary repairs made at this time rather than waiting until the season actually opens, he will no doubt appreciate that you are rendering him a real service.

The fact that the tractor works constantly under a heavy load makes it necessary to keep the machine in good mechanical order if satisfactory results are to be secured. Every tractor may not require a complete overhauling. However, in all probability after a season's use the valves will need grinding and carbon removed. Possibly the bearings should be taken up; the manifold may require cleaning or the vapor tube replaced. Perhaps the air washer float or radiator leaks and should be soldered. The coils may require testing and replacement of vibrators. The oil in the crank case, transmission and differential should be drained off, those parts thoroughly washed out and new oil put in.

In soliciting owners for work, the Dealers should suggest that his tractor mechanic be given the opportunity of calling and inspecting the machine before another season's work is begun. The Service man can then advise the owner a good idea as to what repairs are required and, also, whether or not the work is of such a nature that the tractor should be brought to the Dealer's shop. If the latter he can give an estimate of the labor cost of the job.

Anything the Dealer can accomplish to insure the tractor giving satisfactory service will pave the way for easier sales during the coming season.

Lyon's Parts Bins

We regret very much that we made a mistake in naming the manufacturers of the parts bins as shown on pages 48 and 49 of our December Service Bulletin. According to our information we said that they were manufactured by David Lupton and Sons. Since we find that they were manufactured by the LYON METALLIC MFG. CO., AURORA, ILL.

These parts bins are now being sold in Canada by **Cutten and Foster, Ltd.,** of Toronto. We can sincerely recommend these bins to you.

Adjusting Valve Clearance

The usual practice in adjusting valve clearance is to have piston on compression stroke, and set clearance with both valves closed. This should **never** be followed on the Lincoln Motor.

The cams are ground with the back or heel of cam cut in approximately .004″ from a perfect circle. This is to allow for a sufficiently close adjustment and still insure that the valves seat properly on the compression stroke. Figure 63 shows the arc of the cam on which cam roller should rest when valve clearance is adjusted. Place cam in this position as follows: Hand crank motor and watch exhaust valve in No. 1 cylinder right block. When nearly closed the letter "I" of 1-5 center on flywheel should be nearing pointer. Tap crank slightly, until letter "I" is under pointer. Then set inlet valve clearance on No. 1 cylinder at .003 to 004″ using feelers. Note that letter "E" is now about 3″ away from pointer, Have motor turned slightly until letter "E" is directly under pointer, then set exhaust valve clearance at .003 to .004″. Take the rest of the cylinders in the following order, 3-5-7-2-4-6-8 and proceed as outlined above. The two center and two oustide valves are exhaust. Always remember to watch exhaust valve until nearly closed to determine correct position for setting inlet clearance for that cylinder.

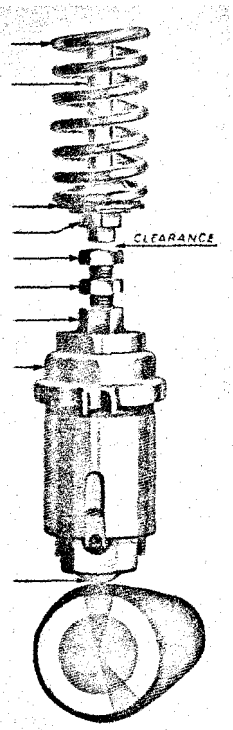

Fig. 63

Bear in mind that extreme care must be exercised in making this adjustment. Noisy or riding valves and burned valve seats will result from improper setting of tappet clearance.